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ABSTRACT

Morgantown (West Virginia) High School developed and implemented a collaborative teaching service delivery model, in which special education students enrolled in given subjects were mainstreamed into regular classes. A regular educator and a special educator were jointly assigned to the classroom to team teach the curriculum. The special and regular educators were jointly responsible for choosing teaching methods, curriculum formats, learning strategies, study skills, and evaluation methods for all students. The regular educator contributed expertise in content matters, whereas the special educator contributed expertise in learning, modification, and evaluation strategies. This paper evaluates whether the program was an effective teaching tool. Fifteen classes were included in the evaluation, involving eight regular educators, five special educators, and a total of 318 students. Special education students had learning disabilities, hearing impairments, behavior disorders, mild mental impairments, or limited English proficiency. Results are analyzed in terms of reading comprehension scores, previous grades in traditional classes, grades in the collaborative teaching program, comparison by student category, teaching team and content area interactions, mean grade point overall and by content area, and grade changes for individual students. Analysis indicated that all students in the Collaborative Teaching Program performed equivalently, despite substantially poorer reading comprehension scores of special education students. All students' grades improved after their enrollment in collaboratively taught classes. (JDD)

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EFFECTIVENESS OF MAINSTREAMING WITH COLLABORATIVE TEACHING

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Introduction

Traditionally, a resource/tutorial model has been used to deliver special education services to high-school students in Monongalia County. Although these resource services may well have been beneficial in improving their basic academic skills, performance of mainstreamed special education students in regular classes has remained poor. As a result, the academic failure rate in this population has been high, and a disproportionate number of special students fail to complete high school.

One possible explanation for this failure is that the resource/tutorial model hinders special educators' involvement in the most critical school-based experience of children with learning, sensory, or emotional problems -- success in the regular mainstreamed classroom. In response to this failure, Morgantown High School (MHS) has developed and implemented a "collaborative teaching" service delivery model during the 1992-93 school year. With this model, special ed. students who enroll in a specific subject were mainstreamed in a regular class with a regular teacher and regular students. A special educator was also assigned to this classroom, to team-teach the curriculum. The special and regular educators were jointly responsible for choosing teaching methods, curriculum formats, learning strategies, study skills, and evaluation methods for all students. The regular educator contributed his/her expertise in content matters, whereas the special educator contributed his/her expertise in learning, modification, and evaluation strategies.

The purpose of this study was to evaluate whether the MHS Collaborative Teaching Program is an effective teaching tool.

Procedure

15 classes, covering four subject areas, were included in the Collaborative Teaching Program. This involved eight regular educators, five special educators, and 383 students (249 regular, 134 special). By far, the largest number of special education students were identified as learning disabled. However, children with hearing impairment, behavior disorders, mild mental impairment, and a number of non-English speakers were also included in the program.

Students' course grades and attendance records provided the basic data for the study. A few mainstreamed students still received resource/tutorial special education services, but not enough to constitute an adequate control group. Consequently, inferences were based on comparisons across students in the Collaborative Teaching Program, and with students' performance prior to the program's implementation.

65 students were not retained in the Collaborative Teaching Program for the entire school year. Their data was excluded from the analyses reported herein.

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Comparison of Regular vs. Special Ed. Students

Reading Comprehension Scores

Standardized tests present a great challenge to children with identified learning problems. Typically, they cluster at the low end of the range of test scores, and perform substantially worse than children with no identified problems. This pattern is apparent in Fig. 1, which presents the distribution of reading comprehension scores obtained by students in the Collaborative Teaching Program on the CTBS Test. The mean score of 20.98 for special ed. (SPECIAL) students was substantially lower than the 36.2 average score for children with no identified learning problems (REGULAR). In fact, the CTBS reading comprehension scores for SPECIAL students were significantly poorer than for REGULAR students in every collaboratively taught class ($F = 22.66$; $p < 0.0001$).

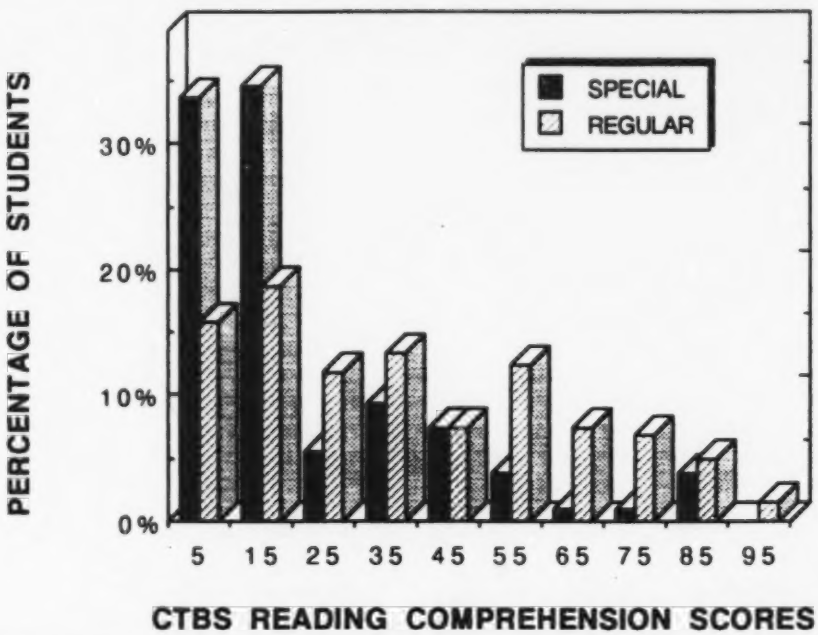


Fig. 1. Distribution of reading comprehension scores obtained by students in the Collaborative Teaching Program. Adjacent bars differentiate results for students who qualify for special ed. services (SPECIAL) from scores obtained by students with no identified learning problems (REGULAR).

Previous Grades in Traditional Classes

In traditionally taught classes, special ed. students' poor performance on standardized tests might be expected to translate into poor class grades. An examination of SPECIAL students' academic history confirms this expectation. For instance, Fig. 2 shows the semester grades earned by students in the year prior to their enrollment in the Collaborative Teaching Program.

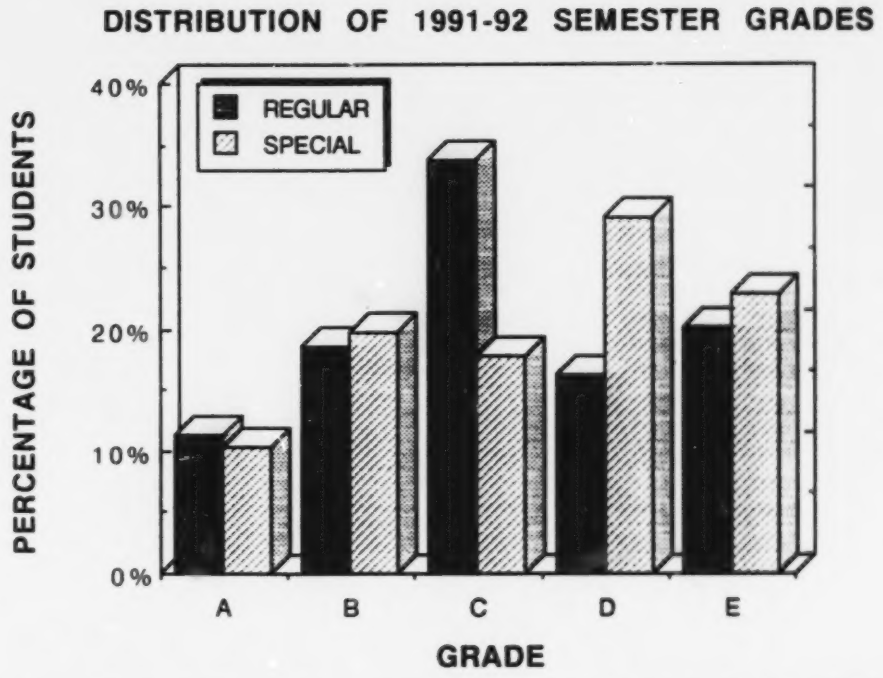


Fig. 2. Distribution of students' mid-year grades, earned in traditional classes during the year prior to enrollment in the Collaborative Teaching Program. Adjacent bars differentiate grades for students who qualify for special ed. services (SPECIAL) from those obtained by students with no identified learning problems (REGULAR).

Grades in Collaborative Teaching Program

For each of four, nine-week grading periods, an analysis of variance was performed on students' grades in the 15 experimental classrooms. Children with identified learning problems were assigned to one category (SPECIAL), while those with no identified problems were assigned to another (REGULAR). Each class was treated as a separate level in the analysis so that factors and/or interactions unique to a specific classroom could be identified. The results are shown in Table 1.

Table 1. ANOVA on Collaborative Teaching Program class grades.

a. Grading Period 1

Factor	*df*	*F*	*p*
Class	14	5.77	0.0001
Student Category (SPECIAL/REGULAR)	1	0.00	0.9992
Student Category X Class	14	1.09	0.3677

b. Grading Period 2

Factor	*df*	*F*	*p*
Class	14	2.16	0.0094
Student Category (SPECIAL/REGULAR)	1	0.33	0.5671
Student Category X Class	14	1.24	0.2442

c. Grading Period 3

Factor	*df*	*F*	*p*
Class	14	7.17	0.0001
Student Category (SPECIAL/REGULAR)	1	1.06	0.3031
Student Category X Class	14	0.96	0.4939

d. Grading Period 4

Factor	*df*	*F*	*p*
Class	14	1.12	0.3401
Student Category (SPECIAL/REGULAR)	1	0.18	0.6694
Student Category X Class	14	0.94	0.5135

Comparison By Student Category

For all four grading periods, Fig. 3 shows that when students are integrated in collaboratively taught classes, special education students (SPECIAL) earned the same grades, on the average, as students with no identified learning problems (REGULAR). In fact, the ANOVA results for all grading periods show no significant difference between grades reported for the two groups of students.

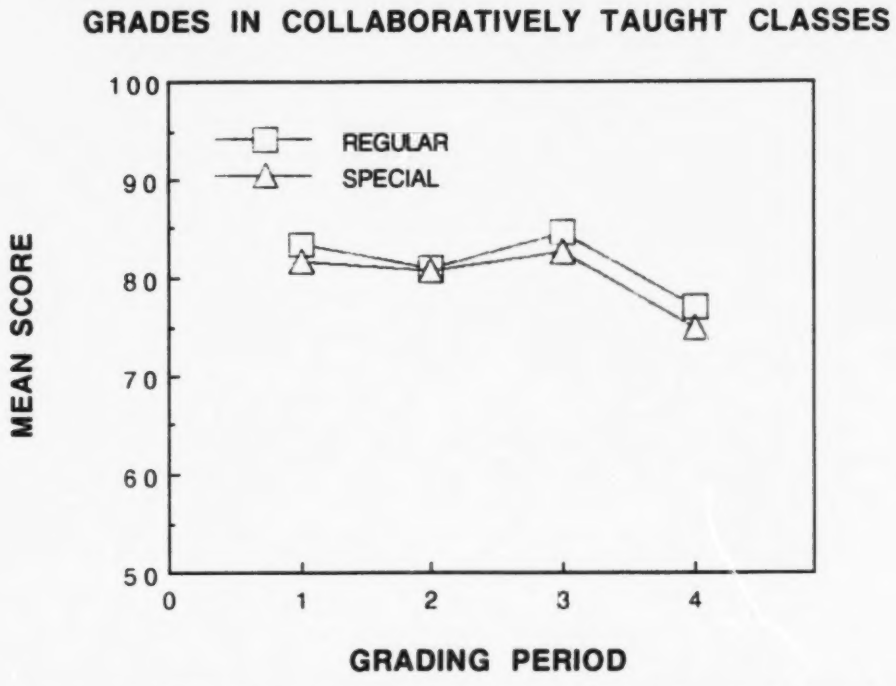


Fig. 3. Average grade of SPECIAL and REGULAR students in collaboratively taught classes for each of the nine-week grading periods during the 1992-93 school year.

Teaching Team and Content Area Interactions

The Collaborative Teaching Program was implemented in Social Studies, English, Science and Health classes. Since instructors established their own evaluation criteria, it is not surprising that the ANOVA results revealed significant differences among the grades reported for the various classes. However, the finding of no significant "Student Category X Class" interaction indicates that the relative performance of SPECIAL and REGULAR students was the same regardless of the teaching team involved or the content area taught.

Grade Comparison - 1992-93 vs. Previous year

Letter grades for English, Social Studies, and Science courses completed in the year prior to students' enrollment in the Collaborative Teaching Program were gathered from their records. Since performance in integrated classes was of primary interest, grades assigned in self-contained, special education classes were excluded from further analysis. To facilitate comparison with the 1992-93 inaugural year of the Collaborative Teaching Program , all midterm and final grades were converted to a grade-point scale, according to the following criteria:

1992-93 Grade	1991-92 Letter Grade	Grade Point
93-100	A	4
86-92	B	3
78-85	C	2
70-77	D	1
<70	E	0

Mean Grade Point By Content Area and Overall

Fig. 4 contrasts the average grade point attained by students in the Collaborative Teaching Program with their performance in the year prior to program implementation. In all three content areas, students' grades for the first semester (SEMESTER) of the Collaborative Teaching Program were substantially higher than they had been during the previous school year. Overall, collaboratively taught classes yielded an increase of almost half of a grade point. Grades for the second semester (FINAL) also showed improvement, but the increase was small (0.14 grade points).

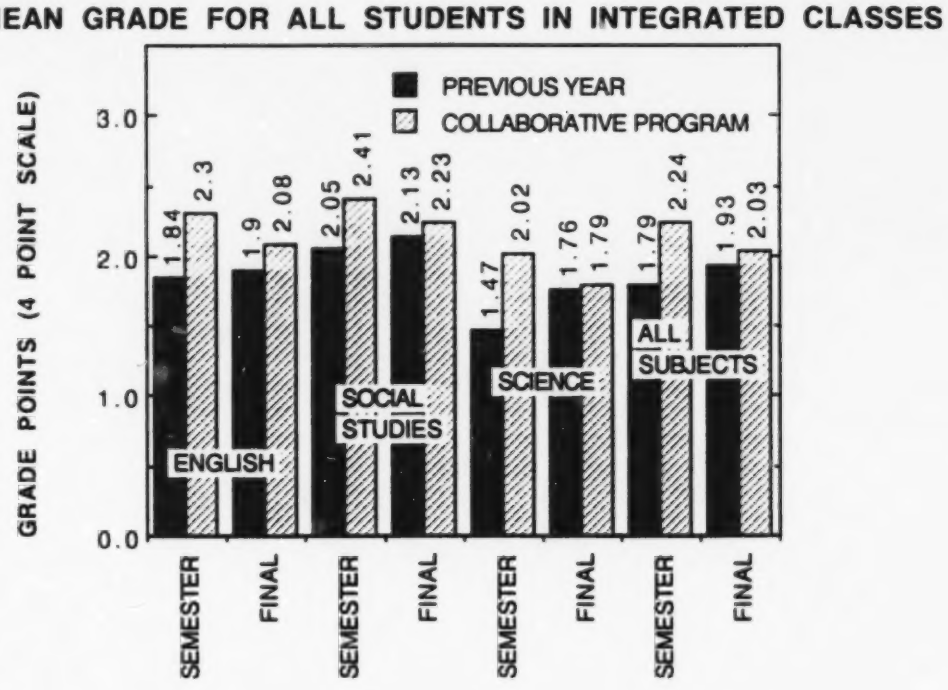
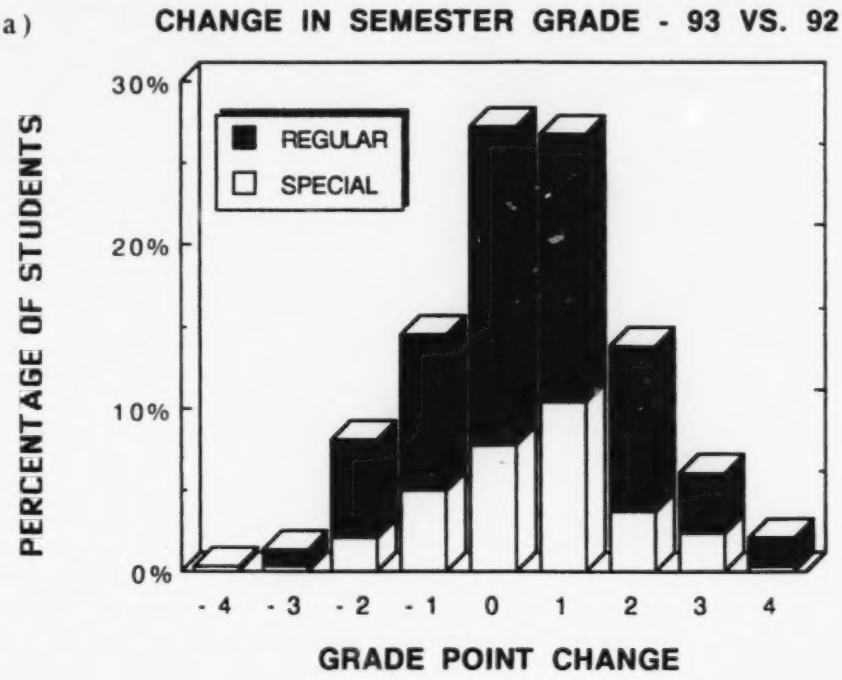


Fig. 4. Mean grade, converted to a four-point scale, for students in the Collaborative Teaching Program. Adjacent bars differentiate grades earned in collaboratively taught classes from those earned in traditional classes during the previous year. Overall grade-point averages are shown, along with results in individual subjects.

Grade Changes for Individual Students

In order to gauge the impact of the Collaborative Teaching Program on individual students, grade point differences were computed to reflect whether and to what extent their grade changed in a particular content area after their enrollment in a collaboratively taught class. For instance, a grade point change of 0 would be computed for students who earned the same grade in a collaboratively taught English class as they had in a traditional English class during the previous year. Distributions of semester and final grade changes are shown in Fig. 5a and 5b, respectively.

a)



b)

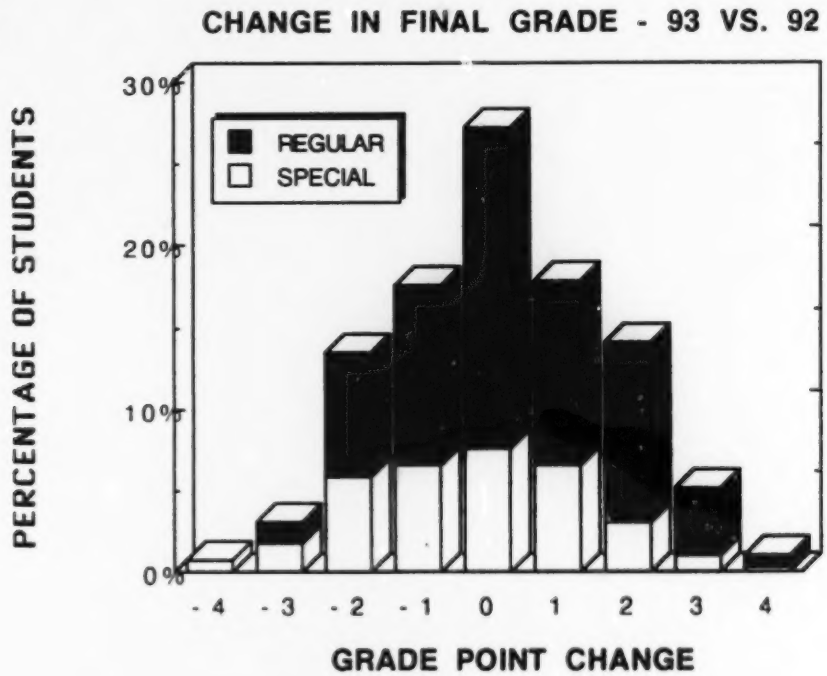


Fig. 5. Difference in grade points earned by students in collaboratively taught classes compared with grade points earned in traditional classes during the previous year. Midterm results are shown in a). Results at the end of the school year are shown in b).

Overall, almost half (48.7%) of students earned higher semester grades in collaboratively taught classes compared with their performance in the same content area during the preceding year. Only 24.2% of students earned poorer grades in the first semester of the Collaborative Teaching Program than they had previously. This improvement in semester grades was statistically significant ($t=5.27$; $p<0.0001$).

Much of this grade improvement was not sustained through the second half of the school year. At the end of the inaugural year of the Collaborative Teaching Program 38.8% of students had better grades than in the previous year, 33.6% had poorer grades, the remainder showed no change. Overall, final grades for the 1992-93 school year showed no significant change from the previous year ($t=1.37$; $p<0.1712$).

Conclusion

This preliminary analysis indicates that all students in the Collaborative Teaching Program performed equivalently, despite the substantially poorer reading comprehension scores of special ed. students. Furthermore, all students' grades improved after their enrollment in collaboratively taught classes.